

WHAT IS CLAIMED IS:

1. A high-speed digital multiplexer including:
  - a plurality of input pins for receiving a plurality of digital input signals;
  - switching circuitry coupled to the input pins, the switching circuitry having respective outputs coupled to a common node, the switching circuitry

5 operative to enable a selected one of the plurality of input pins;

  - a local signal converter having a circuit branch set to a common voltage, the branch connected to the common node to sense changes in current corresponding to an input signal received by an enabled input pin; and
  - an output pin coupled to the local signal converter, whereby the local

10 signal converter is operative to produce voltage changes at the output corresponding to the sensed current changes.

  
- 2. A high-speed digital multiplexer according to claim 1 wherein the switching circuitry comprises:
  - a plurality of semiconductor switches, the plurality of semiconductor switches corresponding to the plurality of input pins.
  
- 3. A high-speed digital multiplexer according to claim 2 wherein the plurality of semiconductor switches comprises a plurality of diodes.
  
- 4. A high-speed digital multiplexer according to claim 1 wherein the local signal converter comprises:
  - a transresistance amplifier.
  
- 5. A high-speed digital multiplexer according to claim 4 wherein the transresistance amplifier includes:
  - a base terminal fixed to a constant voltage;
  - an emitter branch coupled to the common node; and
  - 5 a collector terminal tied to the output pin.

6. A high-speed digital multiplexer for use with a device-interface-board, the device-interface-board adapted for coupling to automatic test equipment, the multiplexer including:

5 a plurality of input pins adapted for coupling to a plurality of automatic test equipment channels;

switching circuitry coupled to the input pins, the switching circuitry having respective outputs coupled to a common node, the switching circuitry operative to enable a selected one of the plurality of input pins;

10 a local signal converter having a circuit branch set to a common voltage, the branch connected to the common node to sense changes in current corresponding to an input signal received by an enabled input pin; and

15 an output pin coupled to the local signal converter, whereby the local signal converter is operative to produce voltage changes at the output corresponding to the sensed current changes.

7. A high-speed digital multiplexer according to claim 6 wherein the switching circuitry comprises:

a plurality of semiconductor switches, the plurality of semiconductor switches corresponding to the plurality of input pins.

5 8. A high-speed digital multiplexer according to claim 7 wherein the plurality of semiconductor switches comprises a plurality of diodes.

9. A high-speed digital multiplexer according to claim 6 wherein the local signal converter comprises:

a transresistance amplifier.

10. A high-speed digital multiplexer according to claim 9 wherein the transresistance amplifier includes:

a base terminal fixed to a constant voltage;

an emitter branch coupled to the common node; and

5 a collector terminal tied to the output pin.

11. A device-interface-board for calibration/validation of automatic test equipment, the device-interface-board including:

at least one test socket adapted for receiving a device-under-test; and  
a high-speed digital multiplexer for selectively passing tester signals

5 from the automatic test equipment to the test socket, the multiplexer including

a plurality of input pins adapted for coupling to a plurality of automatic test equipment channels,

switching circuitry coupled to the input pins, the switching circuitry having respective outputs coupled to a common node, the switching circuitry 10 operative to enable a selected one of the plurality of input pins,

a local signal converter having a circuit branch set to a common voltage, the branch connected to the common node to sense changes in current corresponding to an input signal received by an enabled input pin, and

an output pin coupled to the local signal converter, whereby the 15 local signal converter is operative to produce voltage changes at the output corresponding to the sensed current changes.

12. A high-speed digital multiplexer according to claim 11 wherein the switching circuitry comprises:

a plurality of semiconductor switches, the plurality of semiconductor switches corresponding to the plurality of input pins.

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13. A high-speed digital multiplexer according to claim 12 wherein the plurality of semiconductor switches comprises a plurality of diodes.

14. A high-speed digital multiplexer according to claim 11 wherein the local signal converter comprises:

a transresistance amplifier.

15. A high-speed digital multiplexer according to claim 14 wherein the transresistance amplifier includes:

a base terminal fixed to a constant voltage;  
an emitter branch coupled to the common node; and  
5 a collector terminal tied to the output pin.

16. A method of selecting one from a plurality of high-speed digital input signals applied to a plurality of input pins, the input pins coupled through switching circuitry to a common node, the method comprising the steps:

- 5 applying a constant voltage to the common node;
- detecting current changes at the common node caused by the selected input signal; and
- producing output voltage changes corresponding to the detected current changes.

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